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EXAMINER
NGUYEN, FRANCIS N

ART UNIT	PAPER NUMBER
2674	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/832,232	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	FRANCIS NGUYEN	2674	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *three* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) *7-13,16,17,19,20,22,24,25 and 27* is/are allowed.

6)☐ Claim(s) *1,14,15,18,21,23,26,28-34,36 and 37* is/are rejected.

7)☐ Claim(s) *2-6 and 35* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 April 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitation " a resistance ...is increased with time" (claim 16, page 128, lines 4-7), (claim 22, page 132, lines 17-20), " resistance of the transistor is varied by varying a gate voltage" (claim 17, page 128, lines 2-3) must be shown or the feature(s) canceled from the claim(s) 16 ,17, 22. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 16 is objected to because of the following informalities:

Claim 16 recites limitation " signal application from the signal lines to pixels is increased with time from a beginning to an end of an application time of a single pixel" (page 128, claim 16, lines 5-8). Application time of a single pixel needs clear definition Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14-15 , 21 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 recites limitation " amplitude of scanning lines is varied between positive application and negative application" (page 128, lines 3-4) which is indefinite because positive and negative application term are not defined (in term of voltage, reference point being applied a voltage, positive and negative with respect to what reference point). It is also suggested that description format in Claim 1 be used to describe signal lines, scanning lines, pixels.

Claim 21 recites limitation "a scanning line driving section for varying an amplitude of a voltage supplied to the scanning lines between positive application and negative application (page 131, claim 21, lines 15-17) which is indefinite because positive and negative application term are not defined (in term of voltage, reference point being applied a voltage, positive and negative with respect to what reference point)

Claim 26 recites limitation "a scanning line driving section for varying an amplitude of a voltage supplied to the scanning lines between positive application and negative application (page 135, claim 26, lines 16-18) which is indefinite because positive and negative application term are not defined (in term of voltage, reference point being applied a voltage, positive and negative with respect to what reference point)

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in-
>
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

5. Claims 1, 14-15, 18, 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Yanagi et al. (U.S. Patent 6,359,607).

As to **claim 1**, Yanagi et al. discloses a method for driving an image display device (column 2, lines 15-22) which includes a plurality of pixel electrodes (pixel electrode 103, column 1, lines 34-35) which are formed on a substrate (**electrode substrate**, column 1, lines 24-26) , pixel switching elements which are individually connected to the pixel electrodes **(switching element 102 composed of TFT connected to pixel electrodes**, column 1, lines 33-36), a plurality of signal lines for applying a data signal according to a display image (**plurality of signal lines S(1) through S(n),** column 1, lines 27-29, figure 9, **image signal voltage Vsp** as shown in figure 12, column 2, lines 27-28) to the pixel electrodes, and a common electrode for applying a common potential to pixels (**counter electrode has a potential set to potential VCOM by counter electrode driving circuit COM** , column 2, lines 32-34, figure 9), said method controlling a voltage applied to the pixel electrodes (**pixel potential Vdp** as shown in figure 12,

column 2,lines 30-32) in a conduction period of the pixel switching elements (**scanning voltage Vgh applied to a gate electrode, TFT attains ON state**, column 2, lines 23-29) according to a pulse width supplied to the signal lines (**pulse width waveform Vs with voltage level Vsp shown in figure 12**), wherein the voltage applied to the pixel electrodes is less than a voltage supplied to the signal lines (**pixel potential Vdp is less than potential Vsp by a level shift delta Vd as shown in figure 12**).

As to **claim 14**, Yanagi et al. discloses a method for driving an image display device (**matrix-type liquid crystal display**, column 1, lines 5-9), said method displaying tones by modulating a pulse width of a two-value voltage (pulse width with Voltage Vsp and Vsn, shown in figure 12, applied to signal electrode S(i) shown in figure 11) supplied to signal lines, wherein an amplitude of scanning lines is varied (**amplitude is varied between Vgh, Vgl a**nd when TFT switches On/Off , column 3, lines 38-49) between positive application and negative application (aforementioned Vsp and Vsn) .

As to **claim 15**, the method a set forth in claim 14(see the same citation for claim 14) wherein a difference in amplitude of a voltage supplied to the scanning lines is equal to an amplitude of a voltage supplied to a common electrode (**counter electrode is biased with voltage Vcom so that level shift delta Vd decreases**, column 2, line 67 through column 3, line 1)

As to **claim 18**, Yanagi et al. discloses a driving device of an image display device (column 2,lines 15-22) which includes a plurality of pixel electrodes which are formed on a substrate (**electrode substrate**, column 1, lines 24-26), pixel switching elements (**switching element 102 composed of TFT connected to pixel electrodes**, column 1, lines 33-36) which are individually connected to the pixel electrodes, a plurality of signal lines for applying a data signal according

to a display image (**plurality of signal lines S(1) through S(n),** column 1, lines 27-29, figure 9, **image signal voltage Vsp** as shown in figure 12, column 2, lines 27-28) to the pixel electrodes, and a common electrode for applying a common potential (**Vcom applied to counter electrode shown in figure 9**, column 2, lines 32-34) to pixels,

said driving device applying a voltage between a potential of the signal lines and a potential of the common electrode (**voltage Vd applied at pixel electrode a shown in figure 11**) when a potential of scanning lines is ON (**scan pulse Vg within period TF1 shown in figure 12**), and displaying tones by modulating a pulse width of a two-value voltage supplied to the signal lines **(voltage Vs applied to signal lines shown in figure 12**),

wherein said driving device includes a signal line driving section (signal line driving circuit 200 shown in figure 9, column 1, lines 42-44) for supplying a voltage , not less than a voltage supplied to the pixel electrodes (**Vsp is greater than Vdp shown in figure 12**), to the signal lines.

As to **claim 23**, see same citations for claim 18 since claim 23 differs only from claim 18 as to the scope of an image display device versus driving device of an image display device. Note Yanagi et al. teaches an image display device (LCD display device, column 6, lines 6-8)

6. Claims 28-30, 34, 36-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshida et al. (U.S. Patent 6,496,170).

As to **claim 28**, Yoshida et al. discloses an active matrix-driven image display device (**liquid crystal apparatus**, column 1, lines 5-7) including an image display panel (**active matrix panel 73** shown in figure 8) for displaying an image by switching by a plurality of active elements (**switching element TFT 14**, column 6, lines 30-32) comprising:

a voltage varying circuit (**signal voltage correction circuit 79** shown in figure 8) for varying a voltage of a signal for driving the active elements according to temperature change of the image display panel (**temperature sensor 86 sensing temperature of active matrix panel 73 outputting a temperature signal to signal voltage correction circuit 79** shown in figure 8, column 14, lines 10-13) , so as to carry out temperature compensation of the active elements (output of signal voltage correction circuit is fedback to data signal driver 75 shown in figure 8).

As to **claim 29**, the image display device as set forth in claim 28, wherein said image display panel is a liquid crystal display panel (**liquid crystal apparatus**, column 1, lines 5-7).

As to **claim 30**, the image display device as set forth in claim 28 (see same citation for claim 28), comprising a temperature detector for detecting temperature change of the image display panel (**temperature sensor 86 sensing temperature of active matrix panel 73 as shown in figure 8, column 14, lines 13-15).**

As to **claim 34**, the image display device as set forth in claim 28(see same citation for claim 28), wherein an applied voltage of a tone signal is varied according to temperature change of the image display panel(**output of signal voltage correction circuit is fedback to data signal driver 75 shown in figure 8**). Note that Yoshida et al. discloses control of a voltage value of data signal voltage effects gradation display (column 9, lines 15-20) , this corresponds to the claimed tone signal.

As to **claims 36 and 37**, Yoshida et al. discloses a driving device and associated driving method of an active matrix-driven image display device (**liquid crystal apparatus**, column 1, lines 5-7) having an image display panel (**active matrix panel 73** shown in figure 8) for displaying an image by switching by a plurality of active elements (**switching element TFT**

14, column 6, lines 30-32) , said driving device comprising a voltage varying circuit (**signal voltage correction circuit 79** shown in figure 8) for varying a voltage of a signal for driving the active elements according to temperature change of the image display panel (**temperature sensor 86 sensing temperature of active matrix panel 73 outputting a temperature signal to signal voltage correction circuit 79** shown in figure 8, column 14, lines 10-13) , so as to carry out temperature compensation of the active elements (**output of signal voltage correction circuit is fedback to data signal driver 75 shown in figure 8**).

7. Claim 32 is rejected under 35 U.S.C. 102(e) as being anticipated by Johnson et al. (U.S. Patent 6,329,976).

As to **claim 32**, Johnson et al. discloses an active matrix-driven image display device (**electrooptical display device**, column 1, lines 4-15, TFT 19, column 2, lines 50-51) including an image display panel ( ) for displaying an image by switching by a plurality of active elements (thin film transistors 19 shown in figure 1) comprising:

a voltage varying circuit (**row driver** 16 providing row electrodes 17 with the correct selection voltages , shown in figure 1, column 4, lines 8-10, figure 4) for varying a voltage of a signal for driving the active elements according to temperature change of the image display panel (**correction of voltage level of gate –bias signal**, column 3, lines) , so as to carry out temperature compensation of the active elements (**gate bias signal pertains to TFT 19**), wherein an applied voltage of a scanning signal is varied according to temperature change of the image display panel (**selection voltage/gate bias voltage** as shown in figure 4).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. in view of Okamoto (U.S. Patent 6,094,184) .

As to **claim 31**, Yoshida et al. fails to teach tone display by phase modulation method. Okamoto teaches tone display by phase modulation method (column 14, lines 46-65, **gray-scale signals applied to the signal line electrodes by the signal line electrode driving circuit include phase modulated pulses**, column 15, lines 65-67). **It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus of Yoshida et al., then modify the data signal driver to provide the phase modulated pulses as taught by Okamoto to obtain the apparatus Yoshida et al. modified by Okamoto, because it would result in stable display of intermediate shades as taught by Okamoto (column 16, lines 15-29).**

10. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. in view of Wood et al. (U.S. Patent 5,926,162).

As to **claim 33**, Yoshida et al. fails to teach applied voltage of a common signal is varied according to temperature change of the image display panel. Wood et al. **discloses a common electrode control circuit 110 configured to dynamically adjust a voltage applied to common electrode according to an average of peak voltages associated to temperature of**

liquid crystal layer 106(column 5, lines 35-48, column 8, lines 53-65). **It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus of Yoshida et al. then modify the signal voltage correction circuit to include common electrode control circuit as taught by Wood et al., to obtain the apparatus Yoshida et al. modified by Wood et al. because it would reduce residual voltage across electrodes due to temperature variations as taught by Wood et al.(column 2, lines 34-36) , diminish long-term image retention as taught by Wood et al.** (column 10, lines 13-15) .

Allowable Subject Matter

11. Claims 7-13,16-17, 19-20, 22, 24-25 and 27 are allowed over prior art

12. Claims 21, 26 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

13. Claims 2-6, 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 2, none of prior art teaches a method for driving an image display device , said method controlling a voltage applied to the pixel electrodes in a conduction period of the pixel switching elements according to a pulse width supplied to the signal lines, wherein a proportion of a maximum value of the voltage applied to the pixel electrodes with respect to the voltage supplied to the signal lines becomes different depending on a polarity of the voltage applied to the pixel electrodes.

As to claim 3, none of prior art teaches a method for driving an image display device , said method controlling a voltage applied to the pixel electrodes in a conduction period of the pixel switching elements according to a pulse width supplied to the signal lines, wherein the pulse width of a supplied voltage to the signal lines in the conduction period of the pixel switching elements become different depending on a polarity of the voltages applied to the pixel electrodes, even when displaying the same tone.

As to claim 4, none of prior art teaches a method for driving an image display device , said method controlling a voltage applied to the pixel electrodes in a conduction period of the pixel switching elements according to a pulse width supplied to the signal lines, wherein an allocated time for a single scanning line is different for each polarity of the voltage applied to the pixel electrodes.

As to claim 5, none of prior art teaches a method for driving an image display device , said method controlling a voltage applied to the pixel electrodes in a conduction period of the pixel switching elements according to a pulse width supplied to the signal lines, wherein an amplitude of a voltage supplied to the signal lines is equal to an amplitude of a voltage supplied to the common electrode.

As to claim 6, none of prior art teaches a method for driving an image display device , said method controlling a voltage applied to the pixel electrodes in a conduction period of the pixel switching elements according to a pulse width supplied to the signal lines, wherein a maximum value of an amplitude of the voltage applied to the pixel electrodes is in a range of not less than 80 percent and not more than 98 percent of an amplitude of a voltage supplied to the signal lines.

As to claims 7, 10, 12, none of prior art teaches a method for driving an image display device, said method applying a voltage between a potential of signal lines and a potential of a common electrode when a potential of scanning lines is ON, and displaying tones by modulating a pulse width of a two-value voltage supplied to the signal lines, wherein tones are displayed by shifting phases of waveforms of the signal lines and the scanning lines, and polarity of pixels in a signal line direction are inverted alternately.

As to claims 8-9, 11 and 13, none of prior art teaches a method for driving an image display device, said method applying a voltage between a potential of signal lines and a potential of a common electrode when a potential of scanning lines is ON, and displaying tones by modulating a pulse width of a two-value voltage supplied to the signal lines, wherein tones are displayed by shifting phases of waveforms of the signal lines and the common electrode, and polarity of pixels in a signal line direction are inverted alternately.

As to claims 16-17, none of prior art discloses a method for driving an image display device, said method displaying tones by modulating a pulse width of a two-value voltage supplied to signal lines, wherein a resistance of a transistor which switches ON or OFF signal application from the signal lines to pixels is increased with time from a beginning to an end of an application time of a single pixel.

As to claim 19, none of prior art discloses a driving device of an image display device , said driving device applying a voltage between a potential of the signal lines and a potential of the common electrode when a potential of scanning lines is ON, and displaying tones by modulating

a pulse width of a two-value voltage supplied to the signal lines, wherein said driving device includes a signal line driving section for supplying a signal, which is created by shifting a phase of a voltage waveform whose polarity is inverted per one horizontal period, according to tone data of the display image, with respect to a phase of a voltage waveform of the scanning lines, to the signal lines.

As to claim 20, none of prior art discloses a driving device of an image display device , said driving device applying a voltage between a potential of the signal lines and a potential of the common electrode when a potential of scanning lines is ON, and displaying tones by modulating a pulse width of a two-value voltage supplied to the signal lines, wherein said driving device includes a signal line driving section for supplying a signal, which is created by shifting a phase of a voltage waveform whose polarity is inverted per one horizontal period, according to tone data of the display image, with respect to a phase of a voltage waveform of the common electrode, to the signal lines.

As to claim 22, none of prior art discloses a driving device of an image display device , said driving device applying a voltage between a potential of the signal lines and a potential of the common electrode when a potential of scanning lines is ON, and displaying tones by modulating a pulse width of a two-value voltage supplied to the signal lines, wherein said driving device includes a scanning line driving section for varying an amplitude of a voltage supplied to the scanning lines so that a resistance of a transistor for switching ON or OFF signal application from the signal lines to the pixels is increased with time from a beginning to an end of an application time of a single pixel.

As to claim 24, none of prior art discloses an image display device , said image display device applying a voltage between a potential of the signal lines and a potential of the common electrode when a potential of scanning lines is ON, and displaying tones by modulating a pulse width of a two-value voltage supplied to the signal lines, wherein said image display device includes a signal line driving section for supplying a signal which is created by shifting a phase of a voltage waveform whose polarity is inverted per one horizontal period, according to tone data of the display image, with respect to a phase of a voltage waveform of the scanning lines, to the signal lines.

As to claim 25, none of prior art discloses an image display device , said image display device applying a voltage between a potential of the signal lines and a potential of the common electrode when a potential of scanning lines is ON, and displaying tones by modulating a pulse width of a two-value voltage supplied to the signal lines, wherein said image display device includes a signal line driving section for supplying a signal which is created by shifting a phase of a voltage waveform whose polarity is inverted per one horizontal period, according to tone data of the display image, with respect to a phase of a voltage waveform of the common electrode, to the signal lines.

As to claim 27, none of prior art discloses an image display device , said image display device applying a voltage between a potential of the signal lines and a potential of the common electrode when a potential of scanning lines is ON, and displaying tones by modulating a pulse width of a two-value voltage supplied to the signal lines, wherein said image display device includes a scanning line driving section for varying an amplitude of a voltage supplied to the

scanning lines so that a resistance of a transistor for switching ON or OFF signal application from the signal lines to the pixels is increased with time from a beginning to an end of an application time of a single pixel.

As to claim 35, none of prior art discloses an image display deice comprising a voltage varying circuit for varying a voltage of a signal for driving the active elements, further comprising a step-up circuit for stepping up a signal voltage for driving the active elements, said signal voltage for driving the active elements being stepped up by the step-up circuit after being varied by the voltage varying circuit.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent	5,726,674	Greve
U.S. Patent	5,953,002	Hirai et al.
U.S. Patent	5,754,154	Katakura et al.
U.S. Patent	6,075,511	Iwasaki et al.
U.S. Patent	6,037,920	Mizutome et tal.

Reference Greve is made of record as it discloses a phase modulation technique for driving RMS responding liquid crystal displays.

Reference Hirai et al. is made of record as it discloses a driving method for a liquid crystal device for gradation.

Reference Katakura et al. is made of record as it discloses a liquid crystal display comprising a temperature detection circuit.

Reference Iwasaki et al. is made of record as it discloses a display apparatus with temperature detection circuit.

Reference Mizutomi et al. is made of record as it discloses a liquid crystal apparatus with temperature detection circuit.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Francis Nguyen **(8:00AM to 4:30PM) whose telephone number is** (703) 308-8858.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Richard Hjerpe**, can be reached at **(703) 305-4709.**

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington,

VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is

(703) 306-0377.

FRANCIS NGUYEN

Examiner

Art Unit 2674

January 10th, 2003